

**Properties of Multiplication** – Grades 3 and 4 (Standard 3AF1.5 & 4AF1.0)

Preparation: Place five poster sheets with each property and an example of the property in different areas of the classroom. (Posters included if needed)

**Commutative Property of Multiplication:**

When multiplying, the order of the factors does not change the product.

$$4 \times 2 = 8$$

$$2 \times 4 = 8$$

**Associative Property of Multiplication:**

The way in which the factors are grouped does not change the product.

$$(2 \times 3) \times 5 = 30$$

$$2 \times (3 \times 5) = 30$$

**Identity Property of Multiplication:**

When any number is multiplied by 1, the product is that number.

$$6 \times 1 = 6$$

**Zero Property of Multiplication:**

When any number is multiplied by 0, the product is 0.

$$8 \times 0 = 0$$

**Distributive Property of Multiplication:**

One factor in a multiplication problem can be broken apart to find partial products. The sum of the partial products is the product of the two factors.

$$6 \times 7 = (6 \times 5) + (6 \times 2)$$

Introduction: Review each poster as a **whole class**. (This is *not* a time to take notes) Tell the students you will be giving them a sheet of paper that has an example of one of the properties. It is their job to decide which property their example represents.

Example 1: The teacher models turning the property card over (i.e.  $6 \times 0$ ), decide which property the problem is an example of (zero property), and walking to the poster of the property and stand holding the card so all students can see the example.

The whole class should **choral respond** by reading  $6 \times 0 = 0$  is an example of the zero property of multiplication because any number times zero equals zero.

(Teacher should model at least two cards)

Example 2: Give each student a card face down on their desk. On the signal students turn their card over and decide which property their example represents.

The students will then walk to the property and display their card for everyone to see.

The teacher walks to each property and asks the class if they agree everyone belongs to the property where the teacher is standing. Have a group discussion about similarities and difference in the examples.

Students return to their desks and the cards are all collected.

You-Try 1: Have each group make their own example of every property to share with the whole class. Students should be creative in writing their examples of the properties and not use the same examples they just saw.

The teacher will post the posters around the room and each group will take a “gallery walk” reviewing other students’ examples. (The assumption is the class knows how to do a gallery walk otherwise the teacher needs to take a few minutes to review the expectations of a GW).

You-Try 2: Have each student write in their own notebook the definition of each property and their own example of each property. They can share it with a partner to check their work and reinforce the concepts. (TPS)

## Warm-Up

CST #12 N.S. 1.5	Review:
<p>Which number means <math>1000 + 600 + 8</math> ?</p> <p>A. 168</p> <p>B. 1068</p> <p>C. 1608</p> <p>D. 1680</p>	<p>Which number makes this sentence true?</p> <p style="text-align: center;"><math>7 + \square = 10</math></p> <p>A. 0</p> <p>B. 3</p> <p>C. 7</p> <p>D. 17</p>
Current:	Other:
<p>Use the Commutative Property to solve the following multiplication problems.</p> <p>1) <math>3 \times 5 =</math> <math>5 \times 3 =</math></p> <p>2) <math>8 \times 10 =</math> <math>10 \times 8 =</math></p>	<p>Kim had \$19.23 in her wallet. She spent \$5.72 to rent a movie. How much money does she have left?</p> <p>A. \$13.51</p> <p>B. \$14.41</p> <p>C. \$14.61</p> <p>D. \$24.95</p>

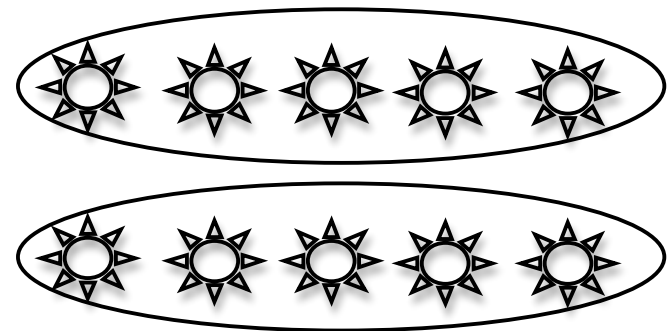
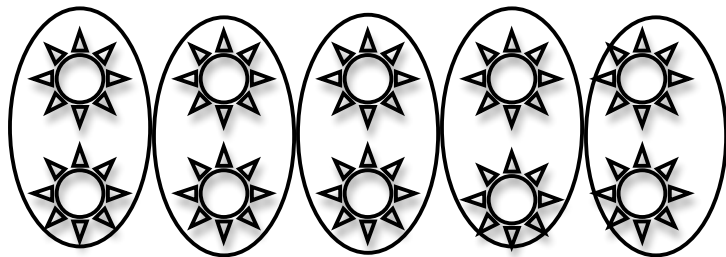
**Today's Objective/Standards: Recognize and use the Properties of Multiplication (3AF1.5 & 4AF1.0)**

**COMMUTATIVE PROPERTY:  
2 FACTORS CAN BE MULTIPLIED  
IN ANY ORDER AND THE  
PRODUCT WILL BE THE SAME.**

**EXAMPLE:**

$$2 \times 5 = 10$$

$$5 \times 2 = 10$$



# ZERO PROPERTY:

ANY FACTOR MULTIPLIED BY  
ZERO WILL EQUAL ZERO.

EXAMPLE:

$$0 \times 5 = 0$$

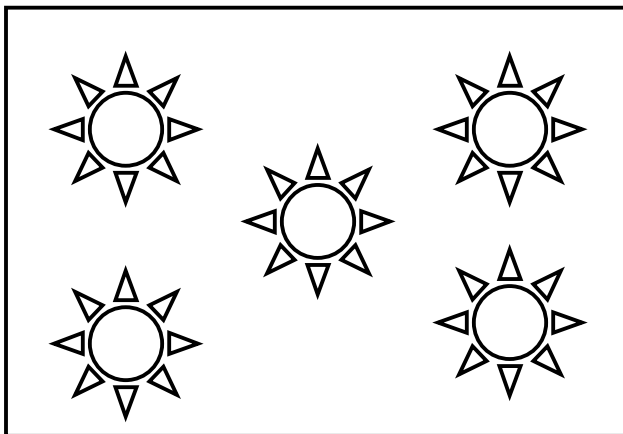
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# IDENTITY PROPERTY:

ANY FACTOR MULTIPLIED BY ONE WILL EQUAL THAT FACTOR.

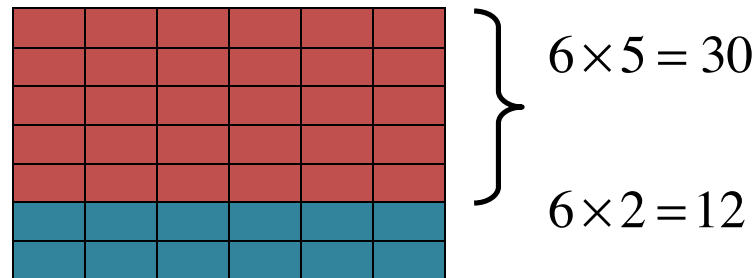
EXAMPLE:

$$5 \times 1 = 5$$



# DISTRIBUTIVE PROPERTY: A PROBLEM CAN BE BROKEN APART INTO SIMPLE PROBLEMS.

EXAMPLE:  $6 \times 7 = (6 \times 5) + (6 \times 2)$



$$\begin{aligned} 6 \times 7 &= (6 \times 5) + (6 \times 2) \\ &= 30 + 12 \\ &= 42 \end{aligned}$$

# ASSOCIATIVE PROPERTY:

THE WAY IN WHICH THE FACTORS ARE GROUPED DOES NOT CHANGE THE PRODUCT.

$$(2 \times 3) \times 4 = 2 \times (3 \times 4)$$

$$6 \times 4 = 2 \times 12$$

$$24 = 24$$



$$0 \times 5 = 0$$

$$0 \times 7 = 0$$

$$0 \times 19 = 0$$

$$0 \times 8 = 0$$

$$50 \times 0 = 0$$

$$14 \times 0 = 0$$

$$50 \times 1 = 50$$

$$13 \times 1 = 13$$



$$23 \times 1 = 23$$

$$1 \times 134 = 134$$

$$1 \times 22 = 22$$

$$1 \times 1 = 1$$

$$9 \times 6 = 54$$

$$6 \times 9 = 54$$

$$8 \times 7 = 56$$

$$7 \times 8 = 56$$

$$2 \times 12 = 24$$

$$12 \times 2 = 24$$

$$10 \times 5 = 50$$

$$5 \times 10 = 50$$



$$3 \times 9 = 27$$

$$9 \times 3 = 27$$

$$7 \times 3 = 21$$

$$3 \times 7 = 21$$

$$10 \times 13 = (10 \times 5) + (10 \times 8)$$

$$7 \times 4 = (7 \times 2) + (7 \times 2)$$

$$6 \times 7 = (6 \times 5) + (6 \times 2)$$

$$6 \times 7 = (6 \times 4) + (6 \times 3)$$

$$12 \times 13 = (12 \times 10) + (12 \times 3)$$

$$11 \times 9 = (11 \times 5) + (11 \times 4)$$



$$(3 \times 4) \times 7 = 3 \times (4 \times 7)$$

$$4 \times (4 \times 5) = (4 \times 4) \times 5$$

$$(8 \times 4) \times 2 = 8 \times (4 \times 2)$$

$$(9 \times 2) \times 4 = 9 \times (2 \times 4)$$

$$(3 \times 6) \times 5 = 3 \times (6 \times 5)$$

$$2 \times (5 \times 4) = (2 \times 5) \times 4$$

$$1 \times 67 = 67$$

$$74 \times 0 = 0$$



$$(9 \times 9) \times 3 = 9 \times (9 \times 3)$$

$$7 \times 9 = 63$$

$$9 \times 7 = 63$$